

Appl. No. 10/727,834
Amendment dated July 7, 2006
Reply to Office action dated May 9, 2006

REMARKS/ARGUMENTS

Applicants have received and carefully reviewed the Office Action of the Examiner mailed May 9, 2006. Claims 1, 3-38, and 40-50 remain pending, with claims 13-37 withdrawn from consideration. Reconsideration and reexamination are respectfully requested.

Rejection under 35 U.S.C. § 102(b)

Claims 1 and 3-9 are rejected as being anticipated by Brandon (GB 2208707A). Applicants respectfully traverse the rejection. Independent claim 1 recites a sensor comprising an enclosure having an input and an output, the enclosure including a permeable wall, a light source adjacent a first end of the enclosure and a light detector adjacent a second end of the enclosure where the enclosure is capable of containing a first fluid. The Examiner states that Brandon discloses that the optical cell may be mounted on the same body 40 of the gas absorbing cell 15 as indicated at 60 in FIG. 4. The Examiner also states that Brandon teaches a second embodiment having an optical cell comprising a body with a transverse bore closed at its ends by windows, an inlet and outlet, a light source mounted outside one window and a photo detector mounted outside the other window. The Examiner has not specifically indicated which element of Brandon is asserted as reading on the claimed enclosure. However, based on the portions of Brandon quoted, it appears that the Examiner is asserting the chamber of the gas absorbing cell is the claimed enclosure, especially in light of the Examiner's quotation of Brandon's teaching of the chamber containing a gas permeable membrane. If Applicants' assumptions are incorrect, the Examiner is respectfully requested to clarify the rejection.

If the Examiner is asserting that the chamber 41, which contains gas permeable membrane 48 and has inlet 44 and outlet 45, reads on the claimed enclosure having an input and an output and a permeable wall, Applicants respectfully submit that Brandon does not appear to teach a light source adjacent a first end of the enclosure and a light detector adjacent a second end of the enclosure, as is recited in claim 1. While Brandon does appear to teach an

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embodiment in which the gas absorbing cell and the optical cell are mounted on the same body, each of the gas absorbing and optical cells appear to have separate enclosures with separate inlets and outlets, and the light source and light detectors are in the optical cell enclosure while the gas permeable membrane is in the gas absorbing cell enclosure. Brandon does not appear to teach an embodiment in which an enclosure having a light source adjacent a first end and a light detector adjacent a second end also includes a permeable wall, as is recited in independent claim 1. Brandon thus does not appear to teach each and every element as is recited in independent claim 1 or the claims dependent thereon.

Additionally, there is no motivation for one of ordinary skill in the art to modify the device of Brandon to achieve the instantly claimed sensor. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejection under 35 U.S.C. § 103

Claims 10-12 are rejected as being unpatentable over Brandon in view of Chandler (US 6,592,822). The Examiner acknowledges that Brandon fails to teach using multiple laser light sources that have different wavelengths or the use of a flow sensor. The Examiner asserts that it would have been obvious to include multiple light sources, using lasers of different wavelengths, as well as including a flow sensor as taught by Chandler to expand the range of possible analytes to be detected and to minimize the testing time to increase the number of tests that can be performed over a predetermined time interval. Applicants respectfully traverse the rejection.

This rejection was made in the previous Office Action and was responded to by Applicants in the last response, however, the Examiner has not responded to Applicants' arguments. Applicants' arguments are repeated below. If this rejection is maintained, the Examiner is respectfully requested to respond to the following arguments.

As stated above, Brandon fails to teach the basic limitations of the claimed sensors. Chandler does not appear to provide what Brandon lacks. Additionally, there is no motivation for one of ordinary skill in the art to combine the teachings of Brandon and Chandler because

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they are directed to different devices involving different sensing properties and different components. Brandon is directed to a sensor for detecting gaseous compounds by detecting a color change when the gas contacts a reagent liquid. See page 1, lines 1-5. Chandler is directed to a flow cytometer for analyzing particles in a fluid mixture based on the particles' optical properties when passing through a laser beam. See column 1, lines 19-56. Applicants submit that there is no reason to combine the devices, and even if one were to make such a combination, one would not arrive at the claimed invention. It is not clear how such a combination would be made because the technologies of the two sensors are so different. It appears one would achieve a gas sensor of Brandon with lasers instead of the light-emitting diode taught by Brandon. However, it is not clear how the lasers of Chandler, which create light-scatter patterns when coming in contact with particles and which excite dyes added to the particles would be useful in the color-change detection system of Brandon. Applicants submit that the combination of Brandon and Chandler, even if made, does not teach or suggest each and every element of the claims as amended. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 38 and 40-46 are rejected as being unpatentable over Brandon in view of Chun et al. (US 6,727,099). The Examiner acknowledges that Brandon fails to teach a tubular permeable membrane enclosure, but asserts that it is well known in the art that permeable membrane enclosures are often tubular in shape, as disclosed by Chun et al.. The Examiner also asserts that it would have been obvious to modify the analyzer of Brandon to use a tubular permeable membrane for the purpose of making the device more cheaply or using a specific geometry to make calculations simpler. Applicants respectfully traverse the rejection.

While Brandon does appear to teach an embodiment in which the gas absorbing cell and the optical cell are mounted on the same body, each of the gas absorbing and optical cells appear to have separate enclosures with separate inlets and outlets, and the light source and light detectors are in the optical cell enclosure while the gas permeable membrane is in the gas absorbing cell enclosure. Brandon does not appear to teach an embodiment in which a membrane enclosure has an input and output with a light source proximate a first end of the

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enclosure and a light detector proximate a second end of the enclosure, as is recited in independent claim 38. As stated above, Brandon appears to teach a device in which a body 40 may have separate gas absorbing and optical cells, each with separate chambers and separate inlets and outlets, with the gas absorbing cell chamber containing the gas permeable membrane and the optical cell enclosure having the light source and light detector. Brandon thus does not appear to teach the basic elements of independent claim 38.

Further, Brandon teaches a device including a gas absorbing cell:

cell comprises a cell body 40 machined from a suitable plastic, for example PVC or PTFE, with a circular cavity 41 in its upper surface...spacer 46 has an oblong aperture 47 cut through it and is placed on the floor of the cavity with the inlet and outlet ports in register with the cut out aperture 47. A gas permeable membrane 48 is placed over the space 46 and held in place by a pressure plate 49 and a screw threaded locking ring 50 which engages screw threads 51 on the peripheral wall of the cavity 41. The aperture 47 thus forms a chamber which is bounded on one side by the gas permeable membrane 48.

See page 6, lines 9-23. Brandon thus appears to teach a plastic body having a cavity 41 containing a gas permeable membrane 48, in which ambient gas is allowed to pass through the membrane into a fluid flowing beneath the membrane. Applicants submit that there is no motivation for one of ordinary skill in the art to substitute a tubular membrane enclosure as taught by Chun et al. for the gas permeable membrane in the cavity taught by Brandon. Chun et al. appear to teach a tubular membrane through which fluid passes from one end to another, as shown in FIG. 2. The mechanics of the devices of Brandon and Chun et al. appear to be quite different, with Chun et al. appearing to teach pumping a fluid through a tubular membrane from end to end while Brandon's device allows ambient gas to pass through a flat membrane into a fluid flowing beneath the flat membrane. Applicants submit that one of ordinary skill in the art, upon reading Brandon, would not have been motivated to look to Chun et al. for modifications.

Additionally, it is not clear how a tubular membrane would be added to the device of Brandon, because Brandon teaches "gases in the ambient air diffuse through the membrane and dissolve in the liquid in the chamber." See page 6, lines 32-34. Brandon also teaches "[t]he

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effective surface area of the gas permeable membrane 48...is therefore large compared with the volume of the chamber. This construction ensures that the rate at which gas is absorbed by the liquid in the cell is high with the result that a high concentration of gas in the liquid can be achieved in a short time." See page 7, lines 1-6.

It is unclear how substituting the tubular membrane of Chun et al. for the flat membrane of Brandon would make the device of Brandon cheaper or make calculations simpler, as is asserted by the Examiner. Reconsideration and withdrawal of the rejection are respectfully requested. If this rejection is maintained, the Examiner is respectfully requested to explain how the asserted modification would achieve the asserted advantages.

Claims 47-50 are rejected as being unpatentable over Brandon in view of Chun et al. and further in view of Chandler. For at least the reasons set forth above, the combination of Brandon and Chun et al. does not appear to teach or suggest the basic elements of independent claim 38, from which claims 47-50 depend. Chandler does not appear to teach what Brandon and Chun et al. lack. Reconsideration and withdrawal of the rejection are respectfully requested.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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